(19) World Intellectual Property Organization International Bureau





(43) International Publication Date 14 October 2004 (14.10.2004)

PCT

(10) International Publication Number WO 2004/088728 A3

(51) International Patent Classification⁷: G02F 1/1333

H01L 21/68,

(21) International Application Number:

PCT/IB2004/050357

(22) International Filing Date: 30 March 2004 (30.03.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 03100879.0

2 April 2003 (02.04.2003) EP

- (71) Applicant (for all designated States except US): KONIN-KLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): GIESBERS, Jacobus, B. [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). BEENHAKKERS, Monique, J. [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). RIJPERT, Cornelis, J., H., A. [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). GELINCK, Gerwin, H. [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). TOUWSLAGER, Fredericus, J. [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (74) Agent: ROLFES, Johannes, G., A.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

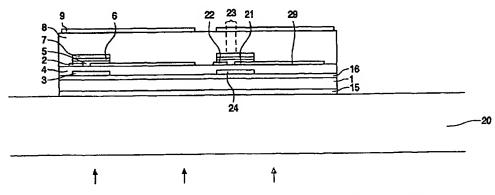
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT,

[Continued on next page]

(54) Title: METHOD OF MANUFACTURING A FLEXIBLE ELECTRONIC DEVICE AND FLEXIBLE DEVICE



(57) Abstract: An electrical element, such as a thin-film transistor, is defined on a flexible substrate (1), in at the substrate (1) is attached to a carrier (20) by an adhesive layer (15), and is delaminated after definition of the transistor. This is for instance due to illumination by UV-radiation. An opaque coating (3, 24) is provided to protect any semiconductor material (5). A heat treatment is preferably given before application of the layers of the transistor to reduce stress in the adhesive layer.

WO 2004/088728 A3



LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

Published:

with international search report

(88) Date of publication of the international search report: 20 October 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Internal al Application No PCT/IB2004/050357

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01L21/68 G02F1/1333

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 HO1L GO2F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the r	Relevant to daim No.	
Y	WO 01/80286 A (THE PENN STATE REFOUNDATION) 25 October 2001 (200 page 15, line 16 - line 32; figurage 26, line 23 - page 27, line page 27, line 19 - line 21	1-3,5-9, 11-14	
Y	EP 0 801 423 A (RAYTHEON COMPANY HOLDINGS, INC. DBA HUGHES ELECTE 15 October 1997 (1997-10-15) column 1, line 44 - line 56 column 2, line 43 - line 45 column 4, line 34 - line 37; fig	1-3,5-9, 11-14	
Y	EP 1 170 345 A (LINTEC CORPORAT) 9 January 2002 (2002-01-09) paragraphs '0015!, '0017!, '00' '0036!, '0061!		1-3,5-9, 11-14
X Fur	ther documents are listed in the continuation of box C.	X Patent family members are listed	In annex.
"A" docum consi "E" earlier filling "L" docum which citatia "O" docum other "P" docum	ategories of cited documents: nent defining the general state of the art which is not dered to be of particular relevance document but published on or after the International date ent which may throw doubts on priority claim(s) or a lis cited to establish the publication date of another on or other special reason (as specified) nent referring to an oral disclosure, use, exhibition or means nent published prior to the international filling date but than the priority date claimed	 'T' later document published after the interpretation or priority date and not in conflict with cited to understand the principle or the invention 'X' document of particular relevance; the cannot be considered novel or cannot involve an inventive step when the description of particular relevance; the cannot be considered to involve an involve and it document is combined with one or ments, such combination being obvious in the art. '&' document member of the same patent 	the application but early underlying the claimed invention to be considered to cournent is taken alone claimed invention wentive step when the one other such docunius to a person skilled
Date of the	e actual completion of the international search	Date of mailing of the international sea	arch report
:	22 July 2005	01/08/2005	

Intermal Application No PCT/IB2004/050357

		PC1/182004/05035/
	citation) DOCUMENTS CONSIDERED TO BE RELEVANT Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Category *	Outside of Cocument, with indication, where appropriate, or the recording passages	
Y	EP 0 442 674 A (ELI LILLY AND COMPANY) 21 August 1991 (1991-08-21)	2,5
Α	column 1, line 5 column 8, line 5 - line 8	1,3,7,9, 11,12
	column 11, line 5 - line 24 column 12, line 9 - line 24; figures 1-7	
Y	GB 2 221 468 A (* FSK KABUSHIKI KAISHA) 7 February 1990 (1990-02-07)	8
T	page 14, line 1 - page 16, line 24 page 27, line 1 - line 11	6
Α	PATENT ABSTRACTS OF JAPAN vol. 013, no. 346 (E-798), 3 August 1989 (1989-08-03) & JP 01 105581 A (SANYO ELECTRIC CO LTD), 24 April 1989 (1989-04-24) abstract	1-14
İ		İ

nation on patent family members

Intermedial Application No
PCT/IB2004/050357

Patent document		Publication		Patent family	Publication
dited in search report		date		member(s)	date
WO 0180286	Α	25-10-2001	US	6399177 B1	04-06-2002
			US	2002048531 A1	25-04-2002 30-10-2001
			AU CA	6102601 A 2406214 A1	25-10-2001
			CN	1427749 A	02-07-2003
			EP	1280617 A2	05-02-2003
			JP	2004507880 T	11-03-2004
			WO	0180286 A2	25-10-2001
			US	2002020053 A1	21-02-2002
			AU	2277001 A	03-07-2001
			CA	2394942 A1	28-06-2001
			CN EP	1413261 A 1254249 A1	23-04-2003 06-11-2002
			JP	2005500507 T	06-01-2005
			WO	0146458 A1	28-06-2001
			ÜS	2002132101 A1	19-09-2002
			ÜS	2002187312 A1	12-12-2002
EP 0801423		15-10-1997	 EP	0801423 A2	15-10-1997
LI UOU1423	^	10 10 1997	JP	2918863 B2	12-07-1999
			JΡ	10075055 A	17-03-1998
	Α	09-01-2002	 JP	2002020699 A	23-01-2002
EP 1170345	A	03-01-5005	CN	1332216 A	23-01-2002
			EP	1170345 A2	09-01-2002
			ÜS	2002019454 A1	14-02-2002
EP 0442674	Α	21-08-1991	US	5108819 A	28-04-1992
L. 01320/3	••		AR	244911 A1	30-11-1993
			AT	136160 T	15-04-1996
			AU	631297 B2	19-11-1992
			AU	7099391 A	15-08-1991
			CA	2036241 A1	15-08-1991
			CN CN	1054147 A ,C 1099191 A	28-08-1991 22-02-1995
			DE	69118226 D1	02-05-1996
			DE	69118226 T2	19-09-1996
			DK	442674 T3	29-04-1996
			EP	0442674 A2	21-08-1991
			ES	2084766 T3	16-05-1996
			FI	910713 A	15-08-1991
			GR	3019621 T3	31-07-1996
			HU	60066 A2	28-07-1992 14-08-1991
			IE IL	910489 A1 97182 A	10-06-1991
			JP	3135930 B2	19-02-2001
			JP	4215739 A	06-08-1992
			ΜX	170859 B	20-09-1993
			NO	910578 A	15-08-1991
			NZ	237055 A	23-12-1993
			PH	27510 A	18-08-1993
			PT	96724 A ,B	30-11-1992
			RU	2049365 C1 5403700 A	27-11-1995 04-04-1995
			US ZA	9100922 A	28-10-1992
					25-10-1989
GB 2221468	Α	07-02-1990	JP	1049754 B	

rmation on patent family members

Internal Application No
PCT/IB2004/050357

Patent document cited in search report	Publication date		Patent family member(s)	Publication date
GB 2221468 A		JP	62205179 A	09-09-1987
		JP	1608022 C	13-06-1991
		JP	2014384 B	06-04-1990
		JP	62205180 A	09-09-1987
		JP	1638457 C	31-01-1992
		JP	2058306 B	07-12-1990
		JP	63017980 A	25-01-1988
		JP	1603517 C	04-04-1991
		JP	2015594 B	12-04-1990
		JP	62153375 A	08-07-1987
		JP	1056112 B	28-11-1989
		JP	1712427 C	11-11-1992
		JP	62153376 A	08-07-1987
		ĴΡ	1608021 C	13-06-1991
		ĴΡ	2015595 B	12-04-1990
		JP	62153377 A	08-07-1987
		GB	2221469 A ,B	07-02-1990
		GB	2221470 A ,B	07-02-1990
		SG	114392 G	24-12-1992
		SG	114592 G	24-12-1992
		SG	114692 G	24-12-1992
		DE	3639266 A1	02-07-1987
		FR	2592390 A1	03-07-1987
		GB	2184741 A ,B	01-07-1987
-		HK	105492 A	08-01-1993
		HK	105592 A	08-01-1993
		HK	105692 A	08-01-1993
		HK	105792 A	08-01-1993
		KR	9107086 B1	16-09-1991
		NL	8603269 A ,B,	16-07-1987
		NL	9302147 A	05-04-1994
		NL	9302148 A	05-04-1994
		NL	9302149 A	05-04-1994
		NL	9302150 A ,B,	05-04-1994
		PH	23580 A	11-09-1989
		SG	114492 G	24-12-1992
		US	4965127 A	23-10-1990
		US	5187007 A	16-02-1993
		US	4756968 A	12-07-1988
JP 01105581 A	24-04-1989	JP	2680582 B2	19-11-1997